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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,448	08/25/2003	Hiroyuki Kumakura	03310.033001	1648

7590 05/16/2006

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EXAMINER

MUSSER, BARBARA J

ART UNIT

PAPER NUMBER

1733

DATE MAILED: 05/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/647,448

Applicant(s)

KUMAKURA, HIROYUKI

Examiner

Barbara J. Musser

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/27/06.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102/103*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3, 6, 7, 10, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by, or in the alternative, under U.S.C. 103(a) as obvious over Takeshita et al.

Takeshita et al. discloses a method of bonding a semi-conductor chip to a substrate with an electrically conductive adhesive such that the connection terminals of the chip and substrate are electrically connected by semi-setting the adhesive on the substrate using a heated pressure head, placing the chip on the semi-set adhesive, and pressing the chip with the heated pressure head at a higher temperature to electrically connect the chip to the substrate and cure the adhesive.(Col. 7, ll. 28-59) It is inherent

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that the placing of the chip requires some degree of pressure of the chip against the adhesive. It is noted that the claim does not require the chip to be on the adhesive prior to the first heating step, but only that it is pressed into the adhesive after it has been heated in the first heating step. The preamble only indicates the chip is placed on the adhesive prior to a heating step, not prior to the first heating step. This reads on the second heating and pressing step. Since Takeshita et al. discloses the adhesive is semi-set, one in the art would understand that it was heated above the reaction start temperature of the adhesive. However, since the adhesive is intended to only partially set, one in the art would understand that the temperature to which the adhesive is heated would be less than its peak reaction temperature since applicant indicates that above this temperature the adhesive has been substantially cured.(Pg. 16, ll. 10-12). Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to heat the adhesive to less than its reaction peak temperature since the adhesive is intended to only partially set in the first heating set and heating it to above its reaction peak temperature would quickly cure the adhesive.

Regarding claim 3, since the adhesive is intended to set, i.e. cure, in the second step, one in the art would understand that it was heated to above the reaction peak temperature.

Regarding claims 10 and 11, Takeskita et al. discloses heating a heatable head to press the chip into the adhesive.(Col. 6, ll. 33-35)

4. Claims 1, 3, 6, 7, 10, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, under U.S.C. 103(a) as obvious over CN1132931A.

CN1132931A discloses a method of bonding a semi-conductor chip to a substrate with an electrically conductive adhesive such that the connection terminals of the chip and substrate are electrically connected by placing the chip on the adhesive, semi-curing the adhesive on the substrate using a heated pressure head, and pressing the chip with the heated pressure head at a higher temperature to electrically connect the chip to the substrate and cure the adhesive.(Chinese Office action, oral translation)

CN1132931A discloses the adhesive is semi-cured, one in the art would understand that it was heated above the reaction start temperature of the adhesive. However, since the adhesive is intended to only partially set, one in the art would understand that the temperature the adhesive is heated to would be less than its peak reaction temperature since applicant indicates that above this temperature the adhesive has been substantially cured.(Pg. 16, ll. 10-12). Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to heat the adhesive to less than its reaction peak temperature since the adhesive is intended to only partially set in the first heating set and heating it to above its reaction peak temperature would quickly cure the adhesive.

Regarding claim 3, since the adhesive is intended to set, i.e. cure, in the second step, one in the art would understand that it was heated to above the reaction peak temperature.

Regarding claims 10 and 11, CN1132931A discloses heating a heatable head to press the chip into the adhesive.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4, 5, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshita et al. in view of JP 2-226738 and JP 11-330162 as set forth in the previous office action.

7. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshita et al. in view of JP 11-330162 as set forth in the previous office action.

8. Claims 4, 5, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over CN1132931A as applied to claim 1 above, and further in view of JP 2-226738 and JP 11-330162.

CN1132931A does not disclose the two pressing steps occurring on different tables. However, such is well-known and conventional in the assembly art as shown for example in JP 2-226739.(Abstract) CN1132931A is also silent as to heating the assembly from the substrate side. However, such is well-known and conventional in the assembly arts as shown for example by JP 1-3301162(paragraph 13, computer translation). Furthermore, one skilled in the art would have readily appreciated that heating the support table or heating the pressing head are obvious alternative expedients for heating the assembly. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use conventional techniques in

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CN1132931A such as performing each pressing step on a separate table and heating the tables to provide the necessary temperatures since such are well-known and conventional in the assembly arts as shown for example by JP 2-226738 and JP 11-330162.

### ***Response to Arguments***

9. Applicant's arguments filed 2/21/06 have been fully considered but they are not persuasive.

Regarding applicant's argument that Takeshita et al. discloses heating then adhesive and then applying the chip to the heated adhesive, the claim only requires that the chip be pressed "onto the adhesive wherein the adhesive is heated to a first temperature". This does not require that the chip be present before the heating of the adhesive, only that the chip is pressed into a heated adhesive. While the preamble discloses placing the chip on the adhesive and heating it while pressing, the claim does not indicate that this heating step is not the second heating step, which is taught by Takeshita et al.

Regarding applicant's argument that the references do not disclose the temperature of the first heating step being above the reaction start temperature and below the reaction peak temperature, Takeshita et al. discloses the adhesive is semi-set, which indicates that it must have been heated above the reaction start temperature as otherwise the adhesive would not have partially cured. Additionally, applicant's specification indicates that above the peak reaction temperature, the adhesive is

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effectively fully cured. Since the first heating step is not intended to fully cure the adhesive, one in the art would understand that it would not be heated above the temperature which would effectively cure the adhesive, particularly since at the peak reaction temperature, the adhesive cures very quickly. The fact that the reference uses different terminology to describe the temperature range does not mean that a temperature which falls within this range would not meet the claim. On the contrary, a reference which teaches a data point which falls within applicant's range would meet the claim limitation, even though it did not describe the temperature based on its reaction start and peak temperatures. For example, a claim that requires the temperature to be above the melting point of water but below its boiling point is met by a reference which teaches a data point within that range, such as water at room temperature, even though it does not describe the temperature range using the same terminology as applicant.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara J. Musser whose telephone number is (571) 272-1222. The examiner can normally be reached on Monday-Thursday; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571)-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.




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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



BJM



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**PRIMARY EXAMINER**